

The Munich Collection of Wellington Cave Fossil Marsupials

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Fig. 1. Richard Dehm (left) and Joachim Schröder (right) at Wellington in 1939.

INTRODUCTION (M. Augee): Mammalian fossils from Wellington Caves, NSW first reached Europe in 1830, when fossils collected by George Ranken were sent to Scotland (Lane and Richards 1963). Shortly thereafter fossils collected at Wellington by Thomas Mitchell were sent to England and France. European interest in Wellington Cave fossils waned by the end of the nineteenth century. By then there was even less interest in Australia until Charles Anderson (Director of the Australian Museum 1921-1940) encouraged the study of Wellington Caves fossils by Australian and foreign paleontologists. Two of the scientists encouraged and helped by Anderson were the German paleontologists Joachim Schröder and Richard Dehm. I had the pleasure of meeting Prof. Dehm in Munich in Jan-Mar 1986 and examining the Wellington Cave material remaining there from that collected by him and Schröder in 1939. The following is Prof. Dehm's own account of his remarkable journey to Australia in 1939 and the fate of the fossils collected by the expedition.

The Origin of the Collection (R. Dehm)

In 1939, Dr Joachim Schröder, then Curator at the Bavarian State Collection for Paleontology and historical Geology in Munich, and I, then Lecturer for Geology and Paleontology at the Munich University, had undertaken a

geological-paleontological journey to Eastern Australia (Fig. 1). The purpose of this journey was the study of typical formations of Australia, especially of Pleistocene marsupial-bearing deposits in caves of Victoria and New South Wales and in the Darling Downs of Queensland.

The main locality was Wellington Caves in New South Wales. With the kind help of Dr C. A. Anderson, Director of the Australian Museum in Sydney, and of local authorities we were able to study there the Pleistocene strata and excavate samples of the fossil fauna, which has been known for 150 years.

Although there are a number of fossil bearing cave deposits at Wellington Caves we concentrated our studies on three sites.

1. "Bone Cave", famous for its red clay full of white bones; we could work in a hidden corner not accessible to the public visitors;
2. "Phosphate Cave" which could be reached only through an old adit of the former Phosphate Company;
3. "Big Sink", also near to the old galleries of the Phosphate Company.

At these localities we gained the impression that the different deposits were not the same age therefore we kept separate the collections of each spot and stratum.

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1. "Bone Cave" (formerly Trueman Bone Cave): the red cave earth, at least three metres thick and exposed by a man-made tunnel, contains numerous bones and sets of teeth, mostly of large and medium-sized marsupials. Sometimes several vertebrae could be seen still articulated. There was no obvious sign of different strata, but thin calcite layers and the horizontal bedding and concentration of bones suggested stratification.

2. "Phosphate Cave": 1.5-2 metres high. The bottom consists of a brown to gray sandy loam of partially 1.5 metres thickness. The loam shows in its upper part, below a thin layer of calcite, a layer with fossil bones and jaws, mostly belonging to medium-sized and small marsupials.

3. "Shaft Cave" (as we called the little cave in the depth of the "Big Sink"): a series of sandy red loam alternating with thin calcite layers, with an overall thickness of at least twelve metres; reached from the bottom of a nearby Phosphate Mine adit to the "Big Sink". Some layers were rich in bones, jaws and many isolated teeth of small marsupials and rodents. We distinguished six layers and took out six

bags of soft material for washing out tiny fossils. One spot appeared specially rich and interesting, but in an attempt to loosen the material it suddenly broke away and the caretaker of the Wellington Caves, Mr Cliff Gardoll (Fig. 2) nearly met with an accident. This rubble (indicated in the Munich collection by the German word for rubble "Abbruch") had many bones but of course their stratification was no longer certain.

The main part of these collections had been sent by the German freighter CHEMNITZ. When war broke out in September 1939, the CHEMNITZ was captured by a French submarine and brought to Marseille. In Australia, Dr Schröder and I had been interned, but soon released, and had received from Prime Minister Robert Menzies permission to leave Australia in March 1940. Through Netherlands, East India, Japan, Korea, Siberia and Russia we came back to Germany in July 1940. In October 1940, we collected our Australian boxes in Marseille and brought them to Munich. Here, in April 1944, during the bombing of Munich most of this material and our field notes were destroyed, except a series of polyprotodont remains which had been loaned to me, as I had been appointed in 1941 to a professorship of Paleontology at the University of Strassburg.

We had left behind in Australia some additional material: some boxes and the six bags from "Shaft Cave". Through Dr M. Baragwanath, Director of the Mines Department of Victoria in Melbourne and Professor Dr Leo A. Cotton at the University of Sydney, these boxes and bags were sent to us safely in 1946. This additional material, together with the remains of the main material, is deposited in the Bavarian State Collection for Paleontology and historical Geology in Munich under inventory number 1939 X.

An Inventory of the Marsupial Fossils Held in Munich in 1986

PROVENANCE: the Wellington Caves system contains various fossil mammal deposits ranging from the Recent to the Early Pliocene in age. Therefore precise information on the site and level at which a fossil was collected is important.

- a. "Bone Cave" (Munich registration numbers 25.743-28.102) refers to fossils collected at position 'X' in Figure 3. This area is currently being excavated by the University of NSW and preliminary results of that work on the fauna of Bone Cave suggests an age of Early Pleistocene with a minimum age of 140,000 years (Dawson 1982).



Fig. 2. Mr Cliff Gardoll, caretaker of Wellington Caves in 1939. His two sons who helped Schröder and Dehm with their excavations are still living in the district.

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- b. "Phosphate Cave" (Munich registration numbers 22.291-25.742) refers to a section of the tunnel system mined by the NSW Phosphate Company 1913-1917. The area, indicated by 'Y' in Figure 3, is a roosting place for the Common Bent Wing Bat, *Miniopterus schreibersii*. The area is not part of the current UNSW study and the age of fossils from it is uncertain.
- c. "Shaft Cave" (Munich registration numbers 20.001-22.290) is also part of the NSW Phosphate Company mine system. In 1939 the site ("Z" in Fig. 3) could be reached through a shaft at the bottom of a natural depression known as the "Big Sink". That shaft was filled not long after the visit of Schröder and Dehm and a second opening higher in the "Big Sink" is now difficult to enter. The site can still be reached with relative ease through the main phosphate mine system and is marked by a brass plate recently put there by the Royal Zoological Society. The age of the deposit has yet to be determined, but the marsupial fossils from this site held in Munich are typical of the "Bone Cave" fauna.

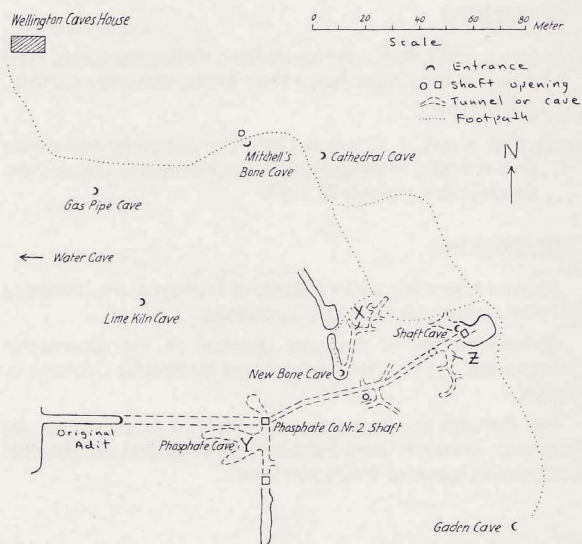


Fig. 3. Sketch of the natural caves and phosphate mine workings at Wellington made by Dehm in 1939. The original sketch has been translated and altered slightly by Augee.

INVENTORY: a full list of the marsupial fossils has been lodged with the Australian Museum, the Wellington Shire Council and the School of Zoology, University of NSW. Genera represented by jaws and/or teeth identified by Augee in 1986 are:

- a. "Bone Cave"
 - Peramelidae — *Perameles*
 - Dasyuridae — *Sarcophilus*, *Dasyurus*
 - Thylacinidae — *Thylacinus*
 - Thylacoleonidae — *Thylacoleo*
 - Vombatidae — *Vombatus*, *Phascolomys*
 - Stenuridae — *Procoptodon*, *Troposodon*
 - Macropodidae — *Macropus*, *Protemnodon*
- b. "Phosphate Cave"
 - Peramelidae — *Perameles*
 - Dasyuridae — *Dasyurus*, *Phascogale*, *Sminthopsis*
- c. "Shaft Cave"
 - Peramelidae — *Perameles*
 - Dasyuridae — *Dasyurus*, *?Antechinus*, *?Sminthopsis*, *Sarcophilus*, *Phascogale*
 - Thylacinidae — *Thylacinus*
 - Burramyidae — *Cercartetus*
 - Thylacoleonidae — *Thylacoleo*
 - Vombatidae — *Vombatus*
 - Macropodidae — *Macropus*, *?Aepyprymnus*

PLACENTAL MAMMALS: the shaft cave deposits contain a canine tooth of the bat *Macroderma*. Rodent teeth and jaws are held but not registered from all three sites. Of particular interest are some 360 rodent jaws with complete molar rows from the shaft cave deposit. These are the subject of a thorough analysis being undertaken at the University of NSW.

DISCUSSION:

While the Munich collection is an important reference and teaching resource in Europe, it contains no mammal material not represented by better specimens in Australian collections. The large collection of rodent jaws, well preserved and well prepared, is an important resource for paleo-ecological studies and is currently under study at the University of NSW. It is unfortunate that the notes made by Schröder and Dehm were destroyed in World War II. Richard Dehm clearly saw the importance of collecting and studying small mammal fossils, especially rodents, and therefore anticipated the current University of NSW project by almost 50 years.

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REFERENCES

- DAWSON, L. 1982. Marsupial fossils from Wellington Caves, New South Wales. Unpublished PhD. thesis, University of NSW, Kensington.
- LANE, E. A. and A. M. RICHARDS, 1963. The discovery, exploration and scientific investigation of the Wellington Caves, New South Wales. *Helictite* 2: 3-52.

THE AUTHORS

Michael Augée is a senior lecturer in Zoology at the University of NSW, Kensington NSW 2033, Australia.

Richard Dehm is the past director of the Bayerische Staatssammlung für Paläontologie und historische Geologie in Munich.

Lyn Dawson is a research paleontologist employed on an Australian Research Grant Scheme (ARGS) project studying the mammalian fossils of Wellington Caves.

EXCURSIONS

Sunday, 19 October

Long Reef Rock Platform

Phil Colman (Marine Biologist) will again introduce us to the fascinating world of a rock platform at low tide.

Booking Essential

Phone Marianne Cochrane: 909-8845
between 5 and 7.30 p.m.

Weekend, 7-9 November:
Barren Grounds Bird Observatory.

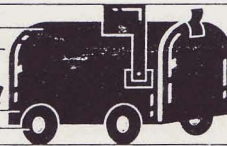
Advance Notice of a
Residential Weekend Trip

Cost will be \$55.00 per head, includes all
meals in lodge-style accommodation.

Bookings (deposit on booking of \$15.00)
open on 1 July (limit 16)

More details to follow

**WE'RE
MOVING!**



Society Offices to Move

The administration offices, meeting room and library of the Royal Zoological Society are due to shift from their present site above the Zoo's North Gate to a new room in the Education Centre complex in June or July. Access for members to the rooms will be via the Education Centre at the West end of the Zoo carpark. The new rooms are being built for housing of the RZS by the Zoological Parks Board, aided by a contribution of \$10,000 from the Society. The RZS has occupied the rooms above the gate since 1971, following a difficult period when the Society occupied rooms in Bull's Chambers, Martin Place, and ANZAC House, College Street. But its true home has always been the Zoo; indeed the provision of suitable meeting, administration, library and even research space was a commitment by the original trustees of Taronga Zoo at the time of the transfer of the animals and assets from the Society's Moore Park Zoo. The new accommodation, which clearly represents a new feeling of co-operation between the RZS and the Zoological Parks Board, is a symbol of the mutual interests as well as the historical connections that tie the two organisations.

M. Augée



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September

Annual General Meeting

It is not too early to mark your calendar for the 1986 AGM of the Society. The Date will be:

SATURDAY, 27th SEPTEMBER

The Safari Room, the traditional venue of the AGM, will no longer exist by that date. The venue and speaker will be announced in the next issue of the *Australian Zoologist*. It has been proposed to hold the meeting a bit later in the afternoon and follow it with an informal, inexpensive buffet. Weather permitting, this could be held in the Education Centre at Taronga, giving members a chance to see the Society's new rooms. Members' comments on this proposal are most welcome.